

U.S. Patent Application Serial No. 09/785,428

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-27 (Canceled)

Claim 28 (Previously Presented) A light emitting semiconductor device comprising a semiconductor substrate, a first conductivity type epitaxial layer and a second conductivity type epitaxial layer or a high resistance epitaxial layer stacked one upon another, a V-groove having a V-shaped cross-section on the semiconductor, wherein an inclined surface of said V-groove is formed from the first conductivity type epitaxial layer to the second conductivity type epitaxial layer or the high resistance epitaxial layer, a bottom of the V-groove lies in said first conductivity type epitaxial layer, a side wall of the V-groove is in contact with the second conductivity type epitaxial layer or the high resistance epitaxial layer, wherein the first conductivity type epitaxial layer, the second conductivity type epitaxial layer or the high resistance layer are present outside the V-groove and an active layer formed inside the bottom of said V-groove on the first conductivity type epitaxial layer.

Claim 29 (Previously Presented) A light emitting semiconductor device according to claim 28, wherein said active layer is sandwiched between a cladding layer inside the V-groove and the first conductive type epitaxial layer outside the V-groove, both layers being in contact

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with each other on a side of said V-groove.

Claim 30 (Previously Presented) A light emitting semiconductor device according to claim 28 or 29, wherein said active layer has a quantum well structure.

Claim 31 (Previously Presented) A light emitting semiconductor device according to claim 29, wherein an energy gap on the first conductive type epitaxial layer outside the V-groove is greater than an energy gap on the cladding layer inside the V-groove.

Claim 32 (Previously Presented) A light emitting semiconductor device according to claim 28, wherein an inclined surface of said V-groove is a {111} B face.

Claim 33 (Previously Presented) A light emitting semiconductor device according to claim 28, wherein the first conductivity type epitaxial layer is a first conductivity type cladding layer and the second conductivity type or high resistance layer is outside the V-groove.

Claim 34 (Previously Presented) A light emitting semiconductor device according to claim 33, wherein an optical guiding layer having refractive index lower than that of said active layer and higher than that of a cladding layer inside the V-groove is provided between said active layer and said cladding layer.

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Claim 35 (Previously Presented) A light emitting semiconductor device according to claim 34, wherein said cladding layer and said optical guiding layer are of the same first conductivity type, said cladding layer inside the V-groove and said optical guiding layer are of the same second conductivity type, and said cladding layer outside the V-groove is of second conductivity type or has high resistance.

Claim 36 (Previously Presented) A light emitting semiconductor device according to claim 33, wherein said V-groove is formed by vapor phase etching.

Claim 37 (Previously Presented) A light emitting semiconductor device according to claim 28, wherein said light emitting semiconductor device is a laser diode.

Claim 38 (Currently Amended) A semiconductor device comprising a V-groove having a V-shaped cross-section on a semiconductor substrate or on an epitaxial growth layer grown on a semiconductor substrate, and a strained active layer is provided only at the bottom of said V-groove, wherein said active layer is sandwiched between a cladding layer inside the V-groove and a cladding layer outside the V-groove, both cladding layers being in contact with each other on a side of said V-groove, and an optical guiding layer having a refractive index lower than that of said active layer and higher than that of the cladding layer inside the V-groove is formed between said active layer and said cladding layer inside said V-groove.

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Claim 39 (Canceled)

Claim 40 (Currently Amended) A semiconductor device according to claim 38 ~~or 39~~, wherein said active layer has a quantum well structure.

Claim 41 (Currently Amended) A semiconductor device according to claim 39 38, wherein an energy gap on the cladding layer outside the V-groove is greater than an energy gap on the cladding layer inside the V-groove.

Claim 42 (Previously Presented) A semiconductor device according to claim 38, wherein an inclined surface of said V-groove is a {111} B face.

Claim 43 (Canceled)

Claim 44 (Currently Amended) A semiconductor device according to claim 43 38, wherein conductivity type of the cladding layer inside said V-groove is different from that of the cladding layer outside said V-groove.

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Claim 45 (Currently Amended) A semiconductor device according to claims ~~43~~ or ~~44~~ 38, wherein conductivity type of the cladding layer inside said V-groove is identical with that of said optical guiding layer.

Claim 46 (Currently Amended) A semiconductor device according to claims ~~43~~ or ~~44~~ 38, wherein said active layer has a quantum well structure.

Claim 47 (Currently Amended) A semiconductor device according to claim ~~43~~ 38, wherein an energy gap of the cladding layer outside said V-groove is greater than an energy gap of the cladding layer inside said V-groove.

Claim 48 (Currently Amended) A semiconductor device according to claim ~~43~~ 38, wherein an inclined surface of said V-groove is a {111} B face.

Claim 49 (Currently Amended) A semiconductor device according to claim ~~43~~ 38, wherein said V-groove is formed by vapor phase etching.

Claim 50 (Previously Presented) A light emitting semiconductor device according to claim 33, wherein said active layer is strained.

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Claim 51 (Previously Presented) A light emitting semiconductor device according to claim 28, further comprising a protective layer for the V-groove on the upper surface of the device.

Claim 52 (Previously Presented) A semiconductor device according to claim 38, further comprising a protective layer for the V-groove on the upper surface of the device.

Claim 53 (Previously Presented) A light emitting semiconductor device comprising a semiconductor substrate, a first conductivity type epitaxial and a second conductivity type epitaxial layer or a high resistance epitaxial layer stacked one upon another, a V-groove having a V-shaped cross-section on the semiconductor substrate, wherein an inclined surface of said V-groove is formed from the first conductivity type epitaxial layer to the second conductivity type epitaxial layer or the high resistance epitaxial layer, a bottom of the V-groove lies in said first conductivity type epitaxial layer, a side wall of the V-groove is in contact with the second conductivity type epitaxial layer or the high resistance epitaxial layer, wherein the first conductivity type epitaxial layer, the second conductivity type epitaxial layer or the high resistance epitaxial layer are present outside the V-groove, and a strained active layer is formed inside the bottom of said V-groove on the first conductivity type epitaxial layer.

Claim 54 (Previously Presented) A semiconductor device according to claim 38, wherein said semiconductor device is a laser diode.